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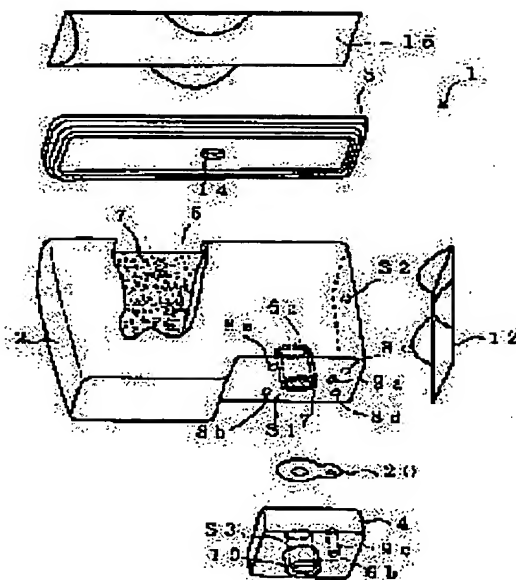
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(54) INK CARTRIDGE FOR INK JET PRINTER

(57)Abstract:

PROBLEM TO BE SOLVED: To open an ink tank to the open air through an air channel at the same time when an ink cartridge is loaded to a printer.

SOLUTION: This ink cartridge comprises an ink tank, ink supply paths 6a, 6b to which an ink supply needle is inserted to be loaded, a protection film 7 which is to be broken when the ink supply needle is loaded and an aligning ring which is brought into intimate contact with the circumference of the ink supply needle when it is loaded. The ink cartridge further comprises air channels 9a-9c provided in the vicinity of the ink supply paths 6a, 6b and a valve member. The valve member closes the air channels in a condition that the ink supply needle is not inserted into the ink supplying paths, but when the ink supply needle is inserted thereto, the valve releases the closing of the air channels such that the valve moves by a stress component in the direction perpendicular to the insertion direction in response to the insertion.



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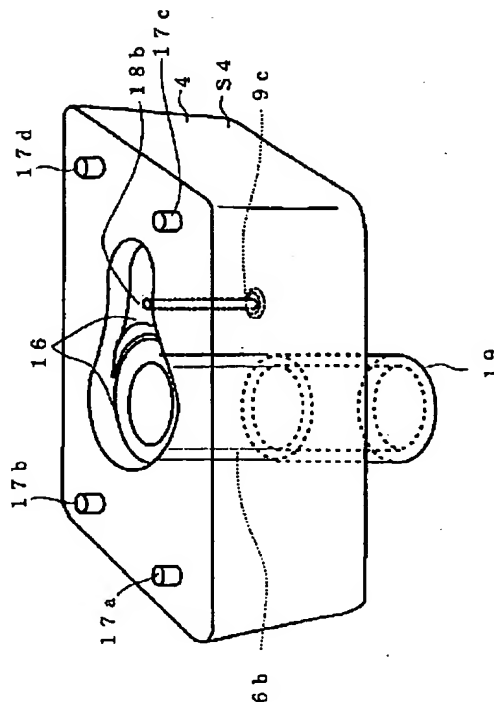
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(54) 【発明の名称】 インクジェットプリンタ用インクカートリッジ

(57) 【要約】

【課題】 インクカートリッジの装填と同時に、インクタンクをエアーチャネルを介して大気開放することができる、インクジェットプリンタ用インクカートリッジを提供する。

【解決手段】 インクタンクTと、インク供給針100が挿着されるインク供給路6a、6bと、インク供給針100が挿着されたときに破壊される保護フィルム7と、インク供給針が挿着されたときに、その外周に密着する調芯リング(21a、21b)とを備えてなり、インク供給路6a、6bに近接して設けられたエアーチャネル9a~9cと、インク供給針がインク供給路に非挿入の状態では、エアーチャネルを閉塞しているが、インク供給針がインク供給路に挿入されると、当該挿入に応動して、挿入方向と垂直な方向の応力成分により移動することにより、エアーチャネルの閉塞を解除するバルブ部材22a、22bとを有してなるインクカートリッジ。



【特許請求の範囲】

【請求項1】 インクタンクと、

前記インクタンク内のインクを外部に供給する、インク供給針が挿着されるインク供給路と、

前記インク供給路の少なくとも一部に設けられ、前記インク供給針が挿着されたときに、破壊される保護フィルムと、

前記インク供給路の一部に設けられ、前記インク供給針が挿着されたときに、前記インク供給針の外周に密着する調芯リングと、

を備えてなるプリントヘッド別体型のインクジェットプリンタ用インクカートリッジにおいて、

少なくとも一部が、前記インク供給路に近接して設けられた、前記インクタンクと大気とを連通させるエアーチャネルと、

前記インク供給針が前記インク供給路に非挿入の状態では、前記エアーチャネルを閉塞しているが、前記インク供給針が前記インク供給路に挿入されると、当該挿入に応動して、挿入方向と垂直な方向の応力成分により移動することにより、前記エアーチャネルの前記閉塞を解除するバルブ部材と、を有してなるインクジェットプリンタ用インクカートリッジ。

【請求項2】 前記インク供給路の前記エアーチャネルに近接する部分が、当該供給路と平行であり、前記調芯リングは、肉厚の形状をなし、前記閉塞解除部材は、前記調芯リングと一体に連結形成された、前記リングの中心軸と平行な中心軸を持つ形状をなし、

前記インク供給針が前記インク供給路に非挿入の状態では、前記エアーチャネルは前記閉塞解除部材のリング部分により閉塞しているが、前記インク供給針が前記インク供給路に挿入されると、前記バルブ部材のリング中央部分が前記エアーチャネルの前記閉塞を解除する、ことを特徴とする請求項1に記載のインクジェットプリンタ用インクカートリッジ。

【請求項3】 前記エアーチャネルの前記インクタンク内への開口部が、当該インクタンクの上部に設けられていることを特徴とする請求項1または2に記載のインクジェットプリンタ用インクカートリッジ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、キャリッジにセットすることのみより、インクタンクと大気とを連通させることができる、プリントヘッド別体型のインクジェットプリンタ用インクカートリッジに関する。

【0002】

【従来の技術】プリントヘッド別体型のインクジェット用インクカートリッジは、インク供給路を介して、インクタンク内のインクを、キャリッジに搭載されたプリントヘッドに供給するように構成されている。

【0003】図6(A)は、この種の、従来のインクカートリッジの構成を示す分解斜視図である。インクカートリッジ80は、カートリッジ本体81と蓋部材82とを有して構成されている。

【0004】カートリッジ本体81は、インクタンクTを有している(図6(A)ではスポンジ83が収容されている)。カートリッジ本体81の上部には、蓋部材82が設けられており、その上部には後述するエアーチャネル90と連通する連通孔84が設けられている。インクカートリッジ80の下部にはインク供給路85が設けられその開口部分には、インクカートリッジが未使用の状態では、保護フィルム86が設けられている。また、この保護フィルム86の内部側には調芯リング87が設けられている。

【0005】インクカートリッジ80の製造課程では、蓋部材82のインク充填用の孔88からインクの充填が行われるがこの孔88は、工場出荷時には、保護シール89(たとえば、合成樹脂シートからなる)により封止されている。

【0006】また、図6(B)に示すように、蓋部材82の上面には、前述した連通孔84に連通する所定のパターン(すなわち、エアーチャネル90)が形成されている。このエアーチャネル90の上面は、当該エアーチャネル90の終端部分91を残して前述した保護シール89により被覆されている。また、終端部分91は、インクカートリッジ80が未使用の状態ではインクタンクTと大気とが連通しないように、気密シール92(たとえば、合成樹脂シートからなる)により封止されている。

【0007】ユーザは、インクカートリッジ80を、図示しないキャリッジに装填するときには、まず気密シール92を剥がして、インクタンクT内と大気とを連通させる。キャリッジには、インクタンクT内のインクを、図示しないプリントヘッドに供給するための図示しないインク供給針が取り付けられており、インクカートリッジ80がキャリッジに装填される課程で、保護フィルム86はインク供給針の先端により破壊される。インクカートリッジ80をキャリッジに装填し終わった状態では、調芯リング87は、インクが漏れ出さないように、インク供給針の外周を密封する。

【0008】

【発明が解決しようとする課題】ところが、ユーザがインクカートリッジ80の使用に際して気密シール92を剥がすとき、誤って保護シール89を剥がしてしまうことがある。保護シール89が剥がされると、インクカートリッジ80内部のインクの蒸発量が過多となる等、インク物性の変化が大きくなり、プリント品質に影響を及ぼす。また、カラーのインクカートリッジの場合には、複数のインクタンクが設けられるが、各インクタンクごとに気密シール92が設けられるため、ユーザにそれぞ

れの気密シールを剥がす作業を強いることになる。

【0009】本発明の目的は、キャリッジへのインクカートリッジの装填と同時に、インクタンクをエアーチャネルを介して大気に開放することができる、プリントヘッド別体型のインクジェットプリンタ用インクカートリッジを提供することにある。

【0010】

【課題を解決するための手段】上述したように、インクカートリッジを、新たに使用する場合には、ユーザは、気密シールの除去およびインクカートリッジの装填とい

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った2つの作業をしなければならない。本発明者は、インクカートリッジの装填の操作のみにより、インクタンクと大気との連通を図ることができれば、保護シールが不用意に剥がされることもなく、またユーザに気密シールを剥がす作業を強いることもない、との知見のもとに本発明をなすに至った。

【0011】本発明は、インクタンクと、インク供給路と、保護フィルムと、調芯リングとを備えてなるプリントヘッド別体型のインクカートリッジに適用される。インクカートリッジは、通常は、プリントヘッドが搭載され

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たキャリッジに装填されるが、必ずしもこれには限定されず、プリンタ内の定位置に設置され、可撓性の供給チューブを介してプリントヘッドにインクを供給するものであってもよい。

【0012】インク供給路は、インクタンク内のインクを外部（すなわち、プリントヘッド）に供給するものであり、当該インク供給路にはインク供給針が挿着される。

【0013】保護フィルムは、インクカートリッジの未使用時には、インクタンク内のインクが外部に漏れ出ないようにするためのもので、インク供給路の大気側の開口部等、インク供給路の少なくとも一部に設けられ、インク供給針が挿着されるときに、当該インク供給針の先端により破壊される。

【0014】調芯リングは、インク供給路の一部に設けられ、インク供給針が挿着されたときに、インク供給針の外周に密着し、インクタンク内のインクの外部への漏出を防止している。

【0015】本発明のインクカートリッジでは、上記構成に加えて、さらに、従来とは異なる、エアーチャネルとバルブ部材とが設けられている。

【0016】エアーチャネルは、少なくとも一部が、前記インク供給路に近接して設けられており、次に述べるように、インク供給針がインク供給路に挿入された状態で、インクタンクと大気とを連通させることができる。エアーチャネルは、その一部または全部を、インクカートリッジの表面部分に形成した所定パターンの溝と、当該溝を被覆する保護シールとにより構成することができる。また、たとえば、異なるモールドを用いた複数回の射出成形（多色成形）技術を用いてカートリッジ本体を

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作成することにより、インクカートリッジ内部にエアーチャネルを形成することもできる。なお、インクタンクの構造にもよるが、通常、エアーチャネルのインクタンク内への開口部は、当該インクタンクの上部に設けられる。

【0017】バルブ部材は、インク供給針が前記インク供給路に非挿入の状態では、エアーチャネルを閉塞しているが、インク供給路にインク供給針が挿入されると、当該挿入に応動して、挿入方向と垂直な方向の応力成分により移動して、エアーチャネルの閉塞を解除するように構成される。バルブ部材は、合成ゴム、プラスチック、金属等の材料により構成することができ、調芯リングと一体に構成することもできるし、調芯リングとは別体に構成することもできる。バルブ部材は、インク供給路にインク供給針が挿入された際に、バルブ部材が調芯リングに近づくように構成することもできるし、バルブ部材が調芯リングから離れるように構成することもできるが、何れの場合でもバルブ部材は、エアーチャネルの閉塞を解除する。

【0018】本発明の好ましい一実施形態例では、インク供給路の前記エアーチャネルに近接する部分が、当該インク供給路と平行であり、調芯リングは肉厚の形状をなし、閉塞解除部材は、調芯リングと一体に連結形成された、当該調芯リングの中心軸と平行な中心軸を持つ形状をなすように構成される。そして、さらに調芯リングと、閉塞解除部材とは、インク供給針がインク供給路に非挿入の状態では、エアーチャネルは前記閉塞解除部材のリング部分により閉塞しているが、インク供給針が前記インク供給路に挿入されると、バルブ部材のリング中央部分が前記エアーチャネルの前記閉塞を解除するように構成される。

【0019】

【発明の実施の形態】図1～図5により本発明のインクカートリッジの一実施例を説明する。

【0020】図1はインクカートリッジ1を下方から見た分解斜視図である。図1に示すように、本実施例のインクカートリッジ1は、中央部構成要素2、上部構成要素3および下部構成要素4を有している。

【0021】中央部構成要素2は容器状をなし、その内部空間はインクタンクTとなっており、スポンジ5が収容されるとともにインクが充填されている。

【0022】中央部構成要素2は、その下面に下部構成要素4を取り付けるための取り付け面S1を有しており、当該取り付け面S1には、インク供給路の一部6aが開口しており、当該開口には保護フィルム7が形成されている。当該取り付け面S1には、後述する下部構成要素4の突起17a～17dと嵌合する穴8a～8dが形成されるとともに、エアーチャネル9の一部9aが開口している（この開口を符号18aで示す）。このエアーチャネル9aは、中央部構成要素2の側面S2に形成

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した溝に、中央部構成要素2の内部を通して連続している。中央部構成要素2の側面S2に形成した溝は、図2に示すように、堰状の連続突起10に囲まれることによりエアーチャンネル9の一部9bを構成している。中央部構成要素2の側面S2の上部には、インクタンクT側に向けて、連通孔11が形成されており、エアーチャンネル9bは、当該連通孔11に連続している。エアーチャンネル9bは、各構成要素2～4が組み立てられた状態で、保護シール12（図1参照）により被覆される。

【0023】図1に示されるように、上部構成要素3は、インクカートリッジ1の蓋部材であり、インクタンクT内にスポンジ5を入れた後に、中央部構成要素2に取り付けられる。上部構成要素3には、インク注入用の孔14が形成されており、インクを注入した後に保護シール15により封止される。

【0024】また、図1に示されるように、下部構成要素4の上面には、中央部構成要素2の取り付け面S1に密着する、取り付け面S3が形成されている。下部構成要素4には、インク供給路の一部6bが形成されており、インク供給路6bの取り付け面S3側の開口は、前述したインク供給路6aの開口と一致する。取り付け面S3には、図3に示すように、後述する調芯リングとバルブ部材が一体となった調芯・バルブ部材20が取り付けられる溝16を有するとともに、前記中央部構成要素2の取り付け面S1に形成された穴8a～8dと嵌合する突起17a～17dが形成されている。溝16の中央部分には、バンクBが形成されており、当該バンクBの、インク供給路6bとは反対側には、図1にも示すような中央部構成要素2を上下に貫通するエアーチャンネル9cが設けられている（エアーチャンネル9cの取り付け面S3での開口を符号18aで示す）。下部構成要素4の下面側には、図1や図3に示すように、図示しないインク供給針との連結を行う連結部材19が突出して形成されている。

【0025】調芯・バルブ部材20は、図4（A）の平面図、および（B）の断面図（（A）におけるFF線断面図）に示すように、リング形状（あるいはドーナツ形状）をなす調芯リング部21と、同じくリング形状をなすバルブ部22との一体構造物である。調芯リング部21のバルブ部22側（符号21aで示す）は、バルブ部22とは反対側（符号21bで示す）よりも肉厚に形成されている。また、バルブ部22の調芯リング部21側（符号22aで示す）は、当該符号21aで示す部分の厚みよりも肉薄に形成され、バルブ部22の調芯リング部21とは反対側（符号22bで示す）は、符号22aで示す部分よりも肉厚に形成されている。また、調芯リング部21の孔23は、図示しないインク供給針の径よりも小さく形成され、バルブ部22の孔24は小さめに形成されている。

【0026】上記構成のインクカートリッジの作用を以

下に説明する。図5（A）は、組み立てられたインクカートリッジ1の、インク供給針が挿入される前の、中央部構成要素3と下部構成要素4との接合部分の様子、すなわち調芯・バルブ部材20が下部構成要素の溝16に取り付けられた状態を示す図であり、図5（B）は、組み立てられたインクカートリッジ1の、インク供給針が挿入されたときの、中央部構成要素3と下部構成要素4との接合部分の様子を示す図である。

【0027】図5（A）に示すように、調芯リング部21の孔23の中心は、インク供給路9bの中央線Lよりも、溝16内に形成されたバンクBとは反対側に偏っている。また、この状態では、エアーチャンネル9aの、中央部構成要素2の取り付け面S1の開口18a、およびエアーチャンネル9cの、下部構成要素4の取り付け面S3の開口18bは、バルブ部22の符号22bで示す部分により閉塞されているので、インクタンクT（図1参照）と大気とが連通することはない。

【0028】一方、図5（B）に示すように、インク供給路9bにインク供給針100が挿入されると、調芯・バルブ部材20は変形する。このとき、調芯リング部21の符号21aで示す部分は、バンクB側に押圧されるとともに、バルブ部22全体を移動させる。これにより、取り付け面S1の開口18a、および取り付け面S3の開口18bの閉塞はバルブ部22の符号22bで示す部分により解除されるので、インクタンクT（図1参照）と大気とは、エアーチャンネル9b、9a、バルブ部22の孔24、エアーチャンネル9cを介して連通する。

【0029】

【発明の効果】以上述べたように、本発明では、キャリアッジへのインクカートリッジの装填と同時に、インクタンクをエアーチャンネルを介して大気に開放することができ、したがって、保護シールがユーザによって不用意に剥がされることもなく、またユーザに気密シールを剥がす作業を強いることもなくなる。

【図面の簡単な説明】

【図1】インクカートリッジ1を下方から見た分解斜視図である。

【図2】中央部構成要素の側面に形成した溝の説明図である。

【図3】下部構成要素の取り付け面S3を示す図である。

【図4】調芯リングとバルブ部材が一体となった調芯・バルブ部材を示す図であり、（A）平面図、（B）は（A）におけるFF線の断面図である。

【図5】（A）はインクカートリッジの、インク供給針が挿入される前の中央部構成要素と下部構成要素の接合部分の様子を示す図、（B）はインクカートリッジの、インク供給針が挿入されたときの中央部構成要素と下部構成要素との接合部分の様子を示す図である。

【図6】（A）は従来のインクカートリッジの構成を示

す分解斜視図、(B)はインクカートリッジの蓋部材の平面図である。

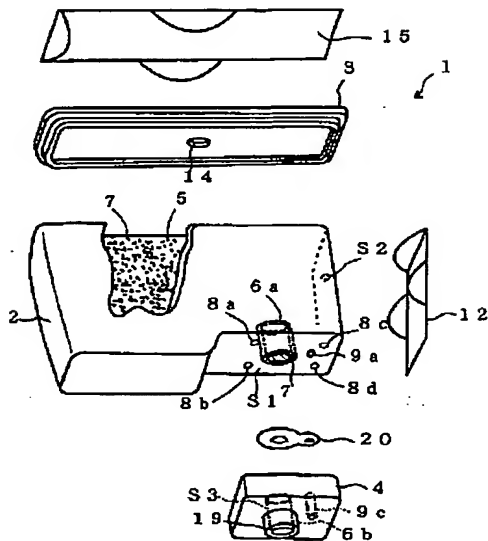
【符号の説明】

- 1 インクカートリッジ
2 中央部構成要素
3 上部構成要素
4 下部構成要素
5 スポンジ
6a, 6b インク供給路
7 保護フィルム
8a~8d 穴
9a, 9b, 9c エアーチャネル
10 連続突起

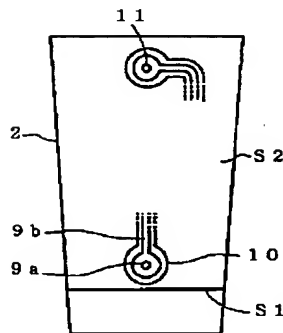
- * 11 連通孔
12 保護シール
14 インク注入用の孔
15 保護シール
16 溝
17a~17d 突起
18a, 18b 開口
19 連結部材
20 調芯・バルブ部材
10 T インクタンク
S1, S3 取り付け面
100 インク供給針

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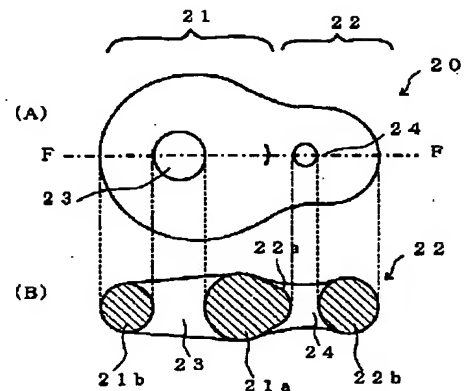
【図1】



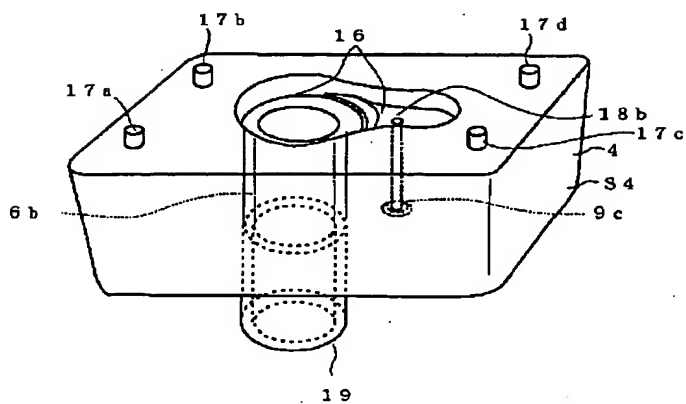
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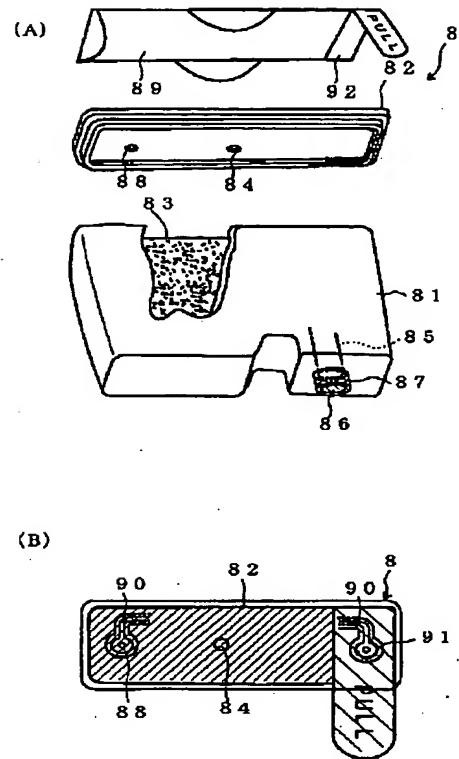
【図4】



【図3】



【図6】



CLAIMS

[Claim(s)]

[Claim 1] When it is prepared in a part of ink tank, ink supply way which supplies the ink in said ink tank outside and where an ink supply needle is inserted, and said ink supply way [at least] and said ink supply needle is inserted When it is prepared in the protection film destroyed and said a part of ink supply way and said ink supply needle is inserted In the ink cartridge for ink jet printers of the form according to print head which comes to have the alignment ring stuck to the periphery of said ink supply needle Although at least the part blockades said Ayr channel in the state of the Ayr channel which was prepared in said ink supply way by approaching and which makes said ink tank and atmospheric air open for free passage, and un-inserting said ink supply needle in said ink supply way The ink cartridge for ink jet printers which comes to have the bulb member of which said lock out of said Ayr channel will be canceled following the insertion concerned by moving by the stress component of a direction perpendicular to the path of insertion if said ink supply needle is inserted in said ink supply way.

[Claim 2] The part close to said Ayr channel of said ink supply way is parallel to the supply way concerned. Said alignment ring Connection formation of nothing and said unblocking member was carried out in the thick configuration at said alignment ring and one. Although said Ayr channel is blockaded by the ring part of said unblocking member in the state of nothing and said ink supply needle un-inserting a configuration with a medial axis parallel to the medial axis of said ring in said ink supply way The ink cartridge for ink jet printers according to claim 1 to which the ring central part of said bulb member will be characterized by what said lock out of said Ayr channel is canceled for if said ink supply needle is inserted in said ink supply way.

[Claim 3] The ink cartridge for ink jet printers according to claim 1 or 2 to which opening into said ink tank of said Ayr channel is characterized by being prepared in the upper part of the ink tank concerned.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink cartridge for ink jet printers of the form according to print head which can do ***** which makes an ink tank and atmospheric air open for free passage only from setting to carriage.

[0002]

[Description of the Prior Art] The ink cartridge for ink jets of the form according to print head is constituted so that the print head in which the ink in an ink tank was carried by carriage may be supplied through an ink supply way.

[0003] Drawing 6 (A) is the decomposition perspective view showing this kind of configuration of the conventional ink cartridge. An ink cartridge 80 has the cartridge body 81 and the covering device material 82, and is constituted.

[0004] The cartridge body 81 has the ink tank T (sponge 83 is held in drawing 6 (A)). The

covering device material 82 is formed in the upper part of the cartridge body 81, and the Ayr channel 90 mentioned later and the free passage hole 84 open for free passage are formed in the upper part. The ink supply way 85 is established in the lower part of an ink cartridge 80, and the protection film 86 is formed in a part for the opening in the condition that an ink cartridge is intact. Moreover, the alignment ring 87 is formed in the interior side of this protection film 86.

[0005] In the manufacture course of an ink cartridge 80, although restoration of ink is performed from the hole 88 for ink restoration of the covering device material 82, at the time of factory shipments, the closure of this hole 88 is carried out with the protection seal 89 (for example, it consists of a synthetic-resin sheet).

[0006] Moreover, as shown in drawing 6 (B), the slot (namely, Ayr channel 90) of the predetermined pattern which is open for free passage to the free passage hole 84 mentioned above is formed in the top face of the covering device material 82. The top face of this Ayr channel 90 is covered with the protection seal 89 which left and mentioned above a part for the trailer 91 of the Ayr channel 90 concerned. Moreover, the closure of the part for a trailer 91 is carried out by the hermetic seal 92 (for example, it consists of a synthetic-resin sheet) so that the ink tank T and atmospheric air may not be open for free passage in the condition that an ink cartridge 80 is intact.

[0007] When loading with an ink cartridge 80 the carriage which is not illustrated, a user removes a hermetic seal 92 first and makes atmospheric air open for free passage in the ink tank T. The ink supply needle which is not illustrated for supplying the ink in the ink tank T to the print head which is not illustrated is attached in carriage, and the protection film 86 is destroyed by the tip of an ink supply needle in the course by which carriage is loaded with an ink cartridge 80. Where carriage finishes being loaded with an ink cartridge 80, the alignment ring 87 seals the periphery of an ink supply needle so that ink may not begin to leak.

[0008]

[Problem(s) to be Solved by the Invention] However, when a user removes a hermetic seal 92 on the occasion of use of an ink cartridge 80, the protection seal 89 may be removed accidentally. If the protection seal 89 is removed, change of ink physical properties will become large and will affect print quality -- the evaporation of the ink of the ink cartridge 80 interior becomes excessive. Moreover, in the case of the ink cartridge of a color, two or more ink tanks are formed, but since a hermetic seal 92 is formed for every ink tank, the activity which removes each hermetic seal will be forced upon a user.

[0009] The purpose of this invention is to offer the ink cartridge for ink jet printers of the form according to print head which can open an ink tank to atmospheric air through the Ayr channel at loading and coincidence of the ink cartridge to carriage.

[0010]

[Means for Solving the Problem] As mentioned above, when newly using an ink cartridge, a user has to do two activities, such as removal of a hermetic seal, and loading of an ink cartridge. this invention person came to make this invention on the basis of the knowledge of not forcing upon a user the activity which removes a hermetic seal, without removing a protection seal carelessly, when the free passage with an ink tank and atmospheric air could be aimed at only by actuation of loading of an ink cartridge.

[0011] This invention is applied to the ink cartridge of the form according to print head which comes to have an ink tank, an ink supply way, a protection film, and an alignment ring. Although the carriage with which the print head was carried is usually loaded with an ink cartridge, it is not necessarily limited to this, but is installed in the orientation in a printer, and may supply ink

to a print head through a flexible supply tube.

[0012] An ink supply way supplies the ink in an ink tank outside (namely, print head), and an ink supply needle is inserted in the ink supply way concerned.

[0013] At the time of intact of an ink cartridge, a protection film is for making it the ink in an ink tank not have leakage appearance in the exterior, and when it is prepared in a part of ink supply way [at least], such as opening by the side of the atmospheric air of an ink supply way, and an ink supply needle is inserted, it is destroyed by the tip of the ink supply needle concerned.

[0014] When it is prepared in a part of ink supply way and an ink supply needle is inserted, the alignment ring was stuck to the periphery of an ink supply needle, and has prevented the exsorption to the exterior of the ink in an ink tank.

[0015] In addition to the above-mentioned configuration, in the ink cartridge of this invention, the different Ayr channel and different bulb member from the former are prepared further.

[0016] At least the part is approached and prepared in said ink supply way, and the Ayr channel is in the condition that the ink supply needle was inserted in the ink supply way, and can make an ink tank and atmospheric air open for free passage so that it may state below. The slot of the predetermined pattern which formed the part or all in the surface part of an ink cartridge, and the protection seal which covers the slot concerned can constitute the Ayr channel. Moreover, the Ayr channel can also be formed in the interior of an ink cartridge by, for example, creating a cartridge body using the injection-molding (multi-color molding) technique of multiple times using different mold. In addition, although based also on the structure of an ink tank, opening into the ink tank of the Ayr channel is usually prepared in the upper part of the ink tank concerned.

[0017] When an ink supply needle is inserted in an ink supply way, following the insertion concerned, a bulb member moves by the stress component of a direction perpendicular to the path of insertion, and although the Ayr channel is blockaded in the state of un-inserting an ink supply needle in said ink supply way, it is constituted so that lock out of the Ayr channel may be canceled. Ingredients, such as synthetic rubber, plastics, and a metal, can constitute a bulb member, it can also be constituted in an alignment ring and one, and can also constitute an alignment ring on another object. In any case, although a bulb member can also be constituted so that a bulb member may approach an alignment ring, when an ink supply needle is inserted in an ink supply way, and it can also constitute so that a bulb member may separate from an alignment ring, as for a bulb member, lock out of the Ayr channel is canceled.

[0018] It consists of desirable examples of 1 operation gestalt of this invention so that the configuration in which the part close to said Ayr channel of an ink supply way has a medial axis parallel [to the ink supply way concerned] and parallel to the medial axis of the alignment ring concerned with which connection formation of nothing and the unblocking member was carried out in the configuration where an alignment ring is thick at an alignment ring and one may be made. And further, although the Ayr channel is blockaded by the ring part of said unblocking member in the state of un-inserting an ink supply needle in an ink supply way, an alignment ring and an unblocking member are constituted so that the ring central part of a bulb member may cancel said lock out of said Ayr channel, when an ink supply needle is inserted in said ink supply way.

[0019]

[Embodiment of the Invention] Drawing 1 - drawing 5 explain one example of the ink cartridge of this invention.

[0020] Drawing 1 is the decomposition perspective view which looked at the ink cartridge 1

from the lower part. As shown in drawing 1 , the ink cartridge 1 of this example has the center-section component 2, the up component 3, and the lower component 4.

[0021] The center-section component 2 serves as nothing in the shape of a container, and the building envelope serves as the ink tank T, and while sponge 5 is held, it fills up with ink.

[0022] the clamp face S1 for the center-section component 2 to attach the lower component 4 in the inferior surface of tongue -- having -- **** -- the clamp face S1 concerned -- a part of ink supply way -- 6a is carrying out opening and the protection film 7 is formed in the opening concerned. while the projections 17a-17d of the lower component 4 mentioned later and the holes 8a-8d which fit in are formed in the clamp face S1 concerned -- a part of Ayr channel 9 -- 9a is carrying out opening (sign 18a shows this opening). This Ayr channel 9a is following the slot formed in the side face S2 of the center-section component 2 through the interior of the center-section component 2. being surrounded by the weir-like projection [continuation] 10 as the slot formed in the side face S2 of the center-section component 2 is shown in drawing 2 -- a part of Ayr channel 9 -- 9b is constituted. The free passage hole 11 is formed in the upper part of the side face S2 of the center-section component 2 towards the ink tank T side, and Ayr channel 9b is following the free passage hole 11 concerned. Ayr channel 9b is in the condition that each components 2-4 were assembled, and is covered with the protection seal 12 (refer to drawing 1).

[0023] As shown in drawing 1 , the up component 3 is the covering device material of an ink cartridge 1, and after it puts in sponge 5 in the ink tank T, it is attached in the center-section component 2. The hole 14 for ink impregnation is formed, and after pouring in ink, the closure is carried out to the up component 3 with the protection seal 15.

[0024] Moreover, as shown in drawing 1 , the clamp face S3 stuck to the clamp face S1 of the center-section component 2 is formed in the top face of the lower component 4. the lower component 4 -- a part of ink supply way -- 6b is formed and opening by the side of the clamp face S3 of ink supply way 6b is in agreement with opening of ink supply way 6a mentioned above. As shown in drawing 3 , while having the slot 16 in which the alignment and the bulb member 20 with which the alignment ring mentioned later and the bulb member were united are attached, the holes 8a-8d formed in the clamp face S1 of said center-section component 2 and the projections 17a-17d which fit in are formed in the clamp face S3. Bank B is formed in the central part of a slot 16, and Ayr channel 9c which penetrates the center-section component 2 as indicated to be ink supply way 6b of the bank B concerned to the opposite side also at drawing 1 up and down is prepared in it (sign 18a shows opening in the clamp face S3 of Ayr channel 9c). As shown in drawing 1 or drawing 3 , the connection member 19 which performs connection to the ink supply needle which is not illustrated is projected and formed in the inferior-surface-of-tongue side of the lower component 4.

[0025] Alignment and the bulb member 20 are the integral-construction objects of the alignment ring section 21 which makes a ring configuration (the shape of or an anchor ring), and the bulb section 22 which similarly makes a ring configuration, as shown in the top view of drawing 4 (A), and the sectional view (FF line sectional view in (A)) of (B). The bulb section 22 side (sign 21a shows) of the alignment ring section 21 is formed more thickly [the bulb section 22] than the opposite side (sign 21b shows). Moreover, the alignment ring section 21 side (sign 22a shows) of the bulb section 22 is formed in closing in rather than the thickness of the part shown by the sign 21a concerned, and the opposite side (sign 22b shows) is formed in the alignment ring section 21 of the bulb section 22 more thickly than the part shown by sign 22a. Moreover, the hole 23 of the alignment ring section 21 is formed smaller than the path of the ink supply needle which is not illustrated, and the hole 24 of the bulb section 22 is formed more smallish.

[0026] An operation of the ink cartridge of the above-mentioned configuration is explained below. Before the ink supply needle of the ink cartridge 1 by which drawing 5 (A) was assembled is inserted, The appearance 20 for a joint of the center-section component 3 and the lower component 4, i.e., alignment and a bulb member, is drawing showing the condition of having been attached in the slot 16 of a lower component. Drawing 5 (B) It is drawing showing the appearance for a joint of the center-section component 3 and the lower component 4 when the ink supply needle of the assembled ink cartridge 1 is inserted.

[0027] As shown in drawing 5 (A), the core of the hole 23 of the alignment ring section 21 inclines toward the opposite side with the bank B formed in the slot 16 from Chuo Line L of ink supply way 9b. moreover -- this condition -- the lower configuration of opening 18a of the clamp face S1 of the center-section component 2 of Ayr channel 9a, and Ayr channel 9c -- since it is blockaded by the part shown by sign 22b of the bulb section 22, the ink tank T (refer to drawing 1) and atmospheric air do not open opening 18b of the clamp face S3 of an important road 4 for free passage

[0028] On the other hand, if the ink supply needle 100 is inserted in ink supply way 9b as shown in drawing 5 (B), alignment and the bulb member 20 will deform. The part shown by sign 21a of the alignment ring section 21 at this time moves the bulb section 22 whole while being pressed at Bank B side. Thereby, since lock out of opening 18a of the clamp face S1 and opening 18b of the clamp face S3 is canceled by the part shown by sign 22b of the bulb section 22, the ink tank T (refer to drawing 1) and atmospheric air are open for free passage through the hole 24 of the Ayr channels 9b and 9a and the bulb section 22, and Ayr channel 9c.

[0029]

[Effect of the Invention] As stated above, in this invention, an ink tank can be opened to atmospheric air through the Ayr channel at loading and coincidence of the ink cartridge to carriage. Therefore, it becomes, without [without a protection seal is carelessly removed by the user, and] forcing upon a user the activity which removes a hermetic seal.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the ink cartridge for ink jet printers of the form according to print head which can do ***** which makes an ink tank and atmospheric air open for free passage only from setting to carriage.

PRIOR ART

[Description of the Prior Art] The ink cartridge for ink jets of the form according to print head is constituted so that the print head in which the ink in an ink tank was carried by carriage may be supplied through an ink supply way.

[0003] Drawing 6 (A) is the decomposition perspective view showing this kind of configuration of the conventional ink cartridge. An ink cartridge 80 has the cartridge body 81 and the covering device material 82, and is constituted.

[0004] The cartridge body 81 has the ink tank T (sponge 83 is held in drawing 6 (A)). The covering device material 82 is formed in the upper part of the cartridge body 81, and the Ayr channel 90 mentioned later and the free passage hole 84 open for free passage are formed in the

upper part. The ink supply way 85 is established in the lower part of an ink cartridge 80, and the protection film 86 is formed in a part for the opening in the condition that an ink cartridge is intact. Moreover, the alignment ring 87 is formed in the interior side of this protection film 86.

[0005] In the manufacture course of an ink cartridge 80, although restoration of ink is performed from the hole 88 for ink restoration of the covering device material 82, at the time of factory shipments, the closure of this hole 88 is carried out with the protection seal 89 (for example, it consists of a synthetic-resin sheet).

[0006] Moreover, as shown in drawing 6 (B), the slot (namely, Ayr channel 90) of the predetermined pattern which is open for free passage to the free passage hole 84 mentioned above is formed in the top face of the covering device material 82. The top face of this Ayr channel 90 is covered with the protection seal 89 which left and mentioned above a part for the trailer 91 of the Ayr channel 90 concerned. Moreover, the closure of the part for a trailer 91 is carried out by the hermetic seal 92 (for example, it consists of a synthetic-resin sheet) so that the ink tank T and atmospheric air may not be open for free passage in the condition that an ink cartridge 80 is intact.

[0007] When loading with an ink cartridge 80 the carriage which is not illustrated, a user removes a hermetic seal 92 first and makes atmospheric air open for free passage in the ink tank T. The ink supply needle which is not illustrated for supplying the ink in the ink tank T to the print head which is not illustrated is attached in carriage, and the protection film 86 is destroyed by the tip of an ink supply needle in the course by which carriage is loaded with an ink cartridge 80. Where carriage finishes being loaded with an ink cartridge 80, the alignment ring 87 seals the periphery of an ink supply needle so that ink may not begin to leak.

EFFECT OF THE INVENTION

[Effect of the Invention] As stated above, in this invention, an ink tank can be opened to atmospheric air through the Ayr channel at loading and coincidence of the ink cartridge to carriage. Therefore, it becomes, without [without a protection seal is carelessly removed by the user, and] forcing upon a user the activity which removes a hermetic seal.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, when a user removes a hermetic seal 92 on the occasion of use of an ink cartridge 80, the protection seal 89 may be removed accidentally. If the protection seal 89 is removed, change of ink physical properties will become large and will affect print quality -- the evaporation of the ink of the ink cartridge 80 interior becomes excessive. Moreover, in the case of the ink cartridge of a color, two or more ink tanks are formed, but since a hermetic seal 92 is formed for every ink tank, the activity which removes each hermetic seal will be forced upon a user.

[0009] The purpose of this invention is to offer the ink cartridge for ink jet printers of the form according to print head which can open an ink tank to atmospheric air through the Ayr channel at loading and coincidence of the ink cartridge to carriage.

MEANS

[Means for Solving the Problem] As mentioned above, when newly using an ink cartridge, a user has to do two activities, such as removal of a hermetic seal, and loading of an ink cartridge. This invention person came to make this invention on the basis of the knowledge of not forcing upon a user the activity which removes a hermetic seal, without removing a protection seal carelessly, when the free passage with an ink tank and atmospheric air could be aimed at only by actuation of loading of an ink cartridge.

[0011] This invention is applied to the ink cartridge of the form according to print head which comes to have an ink tank, an ink supply way, a protection film, and an alignment ring. Although the carriage with which the print head was carried is usually loaded with an ink cartridge, it is not necessarily limited to this, but is installed in the orientation in a printer, and may supply ink to a print head through a flexible supply tube.

[0012] An ink supply way supplies the ink in an ink tank outside (namely, print head), and an ink supply needle is inserted in the ink supply way concerned.

[0013] At the time of intact of an ink cartridge, a protection film is for making it the ink in an ink tank not have leakage appearance in the exterior, and when it is prepared in a part of ink supply way [at least], such as opening by the side of the atmospheric air of an ink supply way, and an ink supply needle is inserted, it is destroyed by the tip of the ink supply needle concerned.

[0014] When it is prepared in a part of ink supply way and an ink supply needle is inserted, the alignment ring was stuck to the periphery of an ink supply needle, and has prevented the exsorption to the exterior of the ink in an ink tank.

[0015] In addition to the above-mentioned configuration, in the ink cartridge of this invention, the different Ayr channel and different bulb member from the former are prepared further.

[0016] At least the part is approached and prepared in said ink supply way, and the Ayr channel is in the condition that the ink supply needle was inserted in the ink supply way, and can make an ink tank and atmospheric air open for free passage so that it may state below. The slot of the predetermined pattern which formed the part or all in the surface part of an ink cartridge, and the protection seal which covers the slot concerned can constitute the Ayr channel. Moreover, the Ayr channel can also be formed in the interior of an ink cartridge by, for example, creating a cartridge body using the injection-molding (multi-color molding) technique of multiple times using different mold. In addition, although based also on the structure of an ink tank, opening into the ink tank of the Ayr channel is usually prepared in the upper part of the ink tank concerned.

[0017] When an ink supply needle is inserted in an ink supply way, following the insertion concerned, a bulb member moves by the stress component of a direction perpendicular to the path of insertion, and although the Ayr channel is blockaded in the state of un-inserting an ink supply needle in said ink supply way, it is constituted so that lock out of the Ayr channel may be canceled. Ingredients, such as synthetic rubber, plastics, and a metal, can constitute a bulb member, it can also be constituted in an alignment ring and one, and can also constitute an alignment ring on another object. In any case, although a bulb member can also be constituted so that a bulb member may approach an alignment ring, when an ink supply needle is inserted in an ink supply way, and it can also constitute so that a bulb member may separate from an alignment ring, as for a bulb member, lock out of the Ayr channel is canceled.

[0018] It consists of desirable examples of 1 operation gestalt of this invention so that the configuration in which the part close to said Ayr channel of an ink supply way has a medial axis parallel [to the ink supply way concerned] and parallel to the medial axis of the alignment ring concerned with which connection formation of nothing and the unblocking member was carried out in the configuration where an alignment ring is thick at an alignment ring and one may be made. And further, although the Ayr channel is blockaded by the ring part of said unblocking member in the state of un-inserting an ink supply needle in an ink supply way, an alignment ring and an unblocking member are constituted so that the ring central part of a bulb member may cancel said lock out of said Ayr channel, when an ink supply needle is inserted in said ink supply way.

[0019]

[Embodiment of the Invention] Drawing 1 - drawing 5 explain one example of the ink cartridge of this invention.

[0020] Drawing 1 is the decomposition perspective view which looked at the ink cartridge 1 from the lower part. As shown in drawing 1 , the ink cartridge 1 of this example has the center-section component 2, the up component 3, and the lower component 4.

[0021] The center-section component 2 serves as nothing in the shape of a container, and the building envelope serves as the ink tank T, and while sponge 5 is held, it fills up with ink.

[0022] the clamp face S1 for the center-section component 2 to attach the lower component 4 in the inferior surface of tongue -- having -- **** -- the clamp face S1 concerned -- a part of ink supply way -- 6a is carrying out opening and the protection film 7 is formed in the opening concerned. while the projections 17a-17d of the lower component 4 mentioned later and the holes 8a-8d which fit in are formed in the clamp face S1 concerned -- a part of Ayr channel 9 -- 9a is carrying out opening (sign 18a shows this opening). This Ayr channel 9a is following the slot formed in the side face S2 of the center-section component 2 through the interior of the center-section component 2. being surrounded by the weir-like projection [continuation] 10 as the slot formed in the side face S2 of the center-section component 2 is shown in drawing 2 -- a part of Ayr channel 9 -- 9b is constituted. The free passage hole 11 is formed in the upper part of the side face S2 of the center-section component 2 towards the ink tank T side, and Ayr channel 9b is following the free passage hole 11 concerned. Ayr channel 9b is in the condition that each components 2-4 were assembled, and is covered with the protection seal 12 (refer to drawing 1).

[0023] As shown in drawing 1 , the up component 3 is the covering device material of an ink cartridge 1, and after it puts in sponge 5 in the ink tank T, it is attached in the center-section component 2. The hole 14 for ink impregnation is formed, and after pouring in ink, the closure is carried out to the up component 3 with the protection seal 15.

[0024] Moreover, as shown in drawing 1 , the clamp face S3 stuck to the clamp face S1 of the center-section component 2 is formed in the top face of the lower component 4. the lower component 4 -- a part of ink supply way -- 6b is formed and opening by the side of the clamp face S3 of ink supply way 6b is in agreement with opening of ink supply way 6a mentioned above. As shown in drawing 3 , while having the slot 16 in which the alignment and the bulb member 20 with which the alignment ring mentioned later and the bulb member were united are attached, the holes 8a-8d formed in the clamp face S1 of said center-section component 2 and the projections 17a-17d which fit in are formed in the clamp face S3. Bank B is formed in the central part of a slot 16, and Ayr channel 9c which penetrates the center-section component 2 as indicated to be ink supply way 6b of the bank B concerned to the opposite side also at drawing 1 up and down is prepared in it (sign 18a shows opening in the clamp face S3 of Ayr channel 9c).

As shown in drawing 1 or drawing 3 , the connection member 19 which performs connection to the ink supply needle which is not illustrated is projected and formed in the inferior-surface-of-tongue side of the lower component 4.

[0025] Alignment and the bulb member 20 are the integral-construction objects of the alignment ring section 21 which makes a ring configuration (the shape of or an anchor ring), and the bulb section 22 which similarly makes a ring configuration, as shown in the top view of drawing 4 (A), and the sectional view (FF line sectional view in (A)) of (B). The bulb section 22 side (sign 21a shows) of the alignment ring section 21 is formed more thickly [the bulb section 22] than the opposite side (sign 21b shows). Moreover, the alignment ring section 21 side (sign 22a shows) of the bulb section 22 is formed in closing in rather than the thickness of the part shown by the sign 21a concerned, and the opposite side (sign 22b shows) is formed in the alignment ring section 21 of the bulb section 22 more thickly than the part shown by sign 22a. Moreover, the hole 23 of the alignment ring section 21 is formed smaller than the path of the ink supply needle which is not illustrated, and the hole 24 of the bulb section 22 is formed more smallish.

[0026] An operation of the ink cartridge of the above-mentioned configuration is explained below. Before the ink supply needle of the ink cartridge 1 by which drawing 5 (A) was assembled is inserted, The appearance 20 for a joint of the center-section component 3 and the lower component 4, i.e., alignment and a bulb member, is drawing showing the condition of having been attached in the slot 16 of a lower component. Drawing 5 (B) It is drawing showing the appearance for a joint of the center-section component 3 and the lower component 4 when the ink supply needle of the assembled ink cartridge 1 is inserted.

[0027] As shown in drawing 5 (A), the core of the hole 23 of the alignment ring section 21 inclines toward the opposite side with the bank B formed in the slot 16 from Chuo Line L of ink supply way 9b. moreover -- this condition -- the lower configuration of opening 18a of the clamp face S1 of the center-section component 2 of Ayr channel 9a, and Ayr channel 9c -- since it is blockaded by the part shown by sign 22b of the bulb section 22, the ink tank T (refer to drawing 1) and atmospheric air do not open opening 18b of the clamp face S3 of an important road 4 for free passage

[0028] On the other hand, if the ink supply needle 100 is inserted in ink supply way 9b as shown in drawing 5 (B), alignment and the bulb member 20 will deform. The part shown by sign 21a of the alignment ring section 21 at this time moves the bulb section 22 whole while being pressed at Bank B side. Thereby, since lock out of opening 18a of the clamp face S1 and opening 18b of the clamp face S3 is canceled by the part shown by sign 22b of the bulb section 22, the ink tank T (refer to drawing 1) and atmospheric air are open for free passage through the hole 24 of the Ayr channels 9b and 9a and the bulb section 22, and Ayr channel 9c.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the decomposition perspective view which looked at the ink cartridge 1 from the lower part.

[Drawing 2] It is the explanatory view of the slot formed in the side face of a center-section component.

[Drawing 3] It is drawing showing the clamp face S3 of a lower component.

[Drawing 4] It is drawing showing the alignment and the bulb member with which the alignment

ring and the bulb member were united, and the (A) top view and (B) are the sectional views of FF line in (A).

[Drawing 5] Drawing in which (A) shows the appearance for a joint of the center-section component before the ink supply needle of an ink cartridge is inserted, and a lower component, and (B) are drawings showing the appearance for a joint of a center-section component when the ink supply needle of an ink cartridge is inserted, and a lower component.

[Drawing 6] The decomposition perspective view in which (A) shows the configuration of the conventional ink cartridge, and (B) are the top views of the covering device material of an ink cartridge.

[Description of Notations]

1 Ink Cartridge

2 Center-Section Component

3 Up Component

4 Lower Component

5 Sponge

6a, 6b Ink supply way

7 Protection Film

8a-8d Hole

9a, 9b, 9c Ayr channel

10 Continuation Projection

11 Free Passage Hole

12 Protection Seal

14 Hole for Ink Impregnation

15 Protection Seal

16 Slot

17a-17d Projection

18a, 18b Opening

19 Connection Member

20 Alignment and Bulb Member

T Ink tank

S1, S3 Clamp face

100 Ink Supply Needle